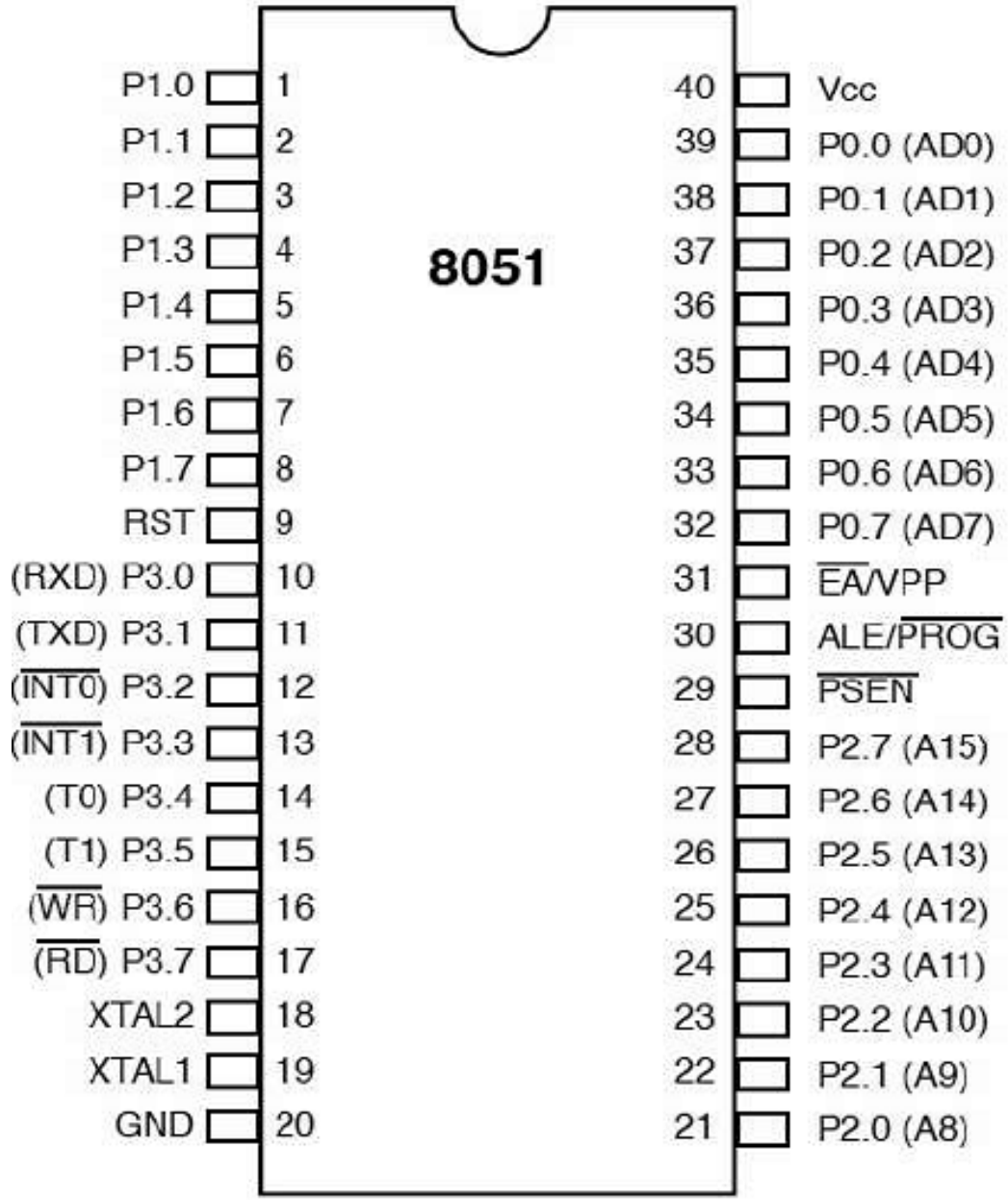
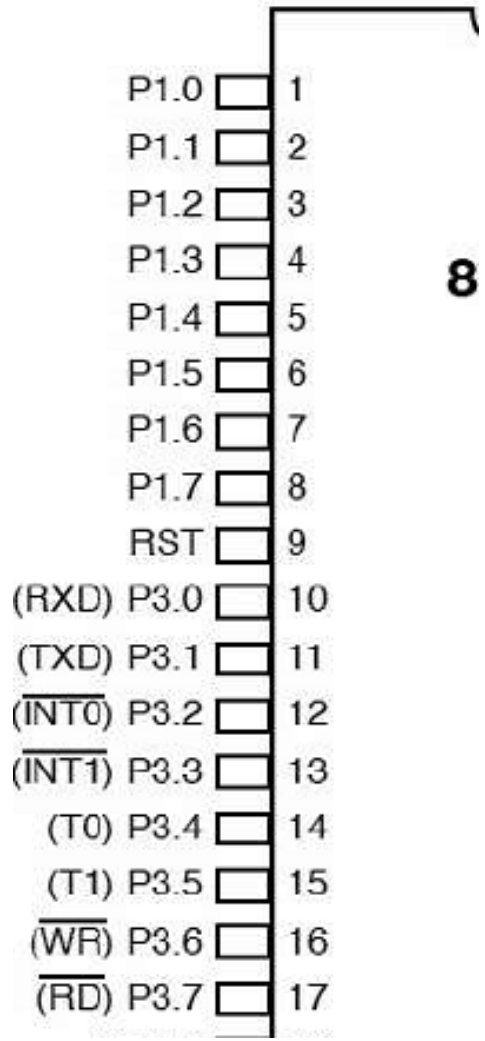
The Microcontroller Architecture:

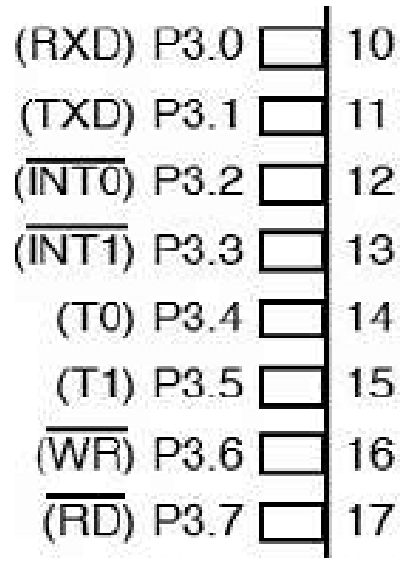
- Introduction to 8051 Microcontroller,
- Architecture,
- Pin configuration,
- Memory organization,
- Input /Output Ports, Counter and Timers,
- Serial communication, Interrupts


8051
P1.0 1
P1.1 2
P1.2 3
P1.3 4
P1.4 5
P1.5 6
P1.6 7
P1.7 8
RST 9
(RXD) P3.0 10
(TXD) P3.1 11
(INT0) P3.2 12
(INT1) P3.3 13
(T0) P3.4 14
(T1) P3.5 15
(WR) P3.6 16
(RD) P3.7 17
XTAL2 18
XTAL1 19
GND 20
40 Vcc
39 P0.0 (AD0)
38 P0.1 (AD1)
37 P0.2 (AD2)
36 P0.3 (AD3)
35 P0.4 (AD4)
34 P0.5 (AD5)
33 P0.6 (AD6)
32 P0.7 (AD7)
31 EA/VPP
30 ALE/PROG
29 PSEN
28 P2.7 (A15)
27 P2.6 (A14)
26 P2.5 (A13)
25 P2.4 (A12)
24 P2.3 (A11)
23 P2.2 (A10)
22 P2.1 (A9)
21 P2.0 (A8)

- The pin diagram of 8051 microcontroller consists of 40 pins as given below:
- **Pin 1-8 (Port1):**
- These are 8-bit bidirectional I/O port with internal pull-up resisters.
- It does not perform any task; it is just an I/O port
- **Pin 9 (RST):**
- It is a Reset input pin which is used to reset the microcontroller to its initial position.
- **Pin 10 to 17 (Port 3):**
- It is also an 8-bit bidirectional I/O port with internal pull-up resisters.
- Additionally, it performs some special functions:

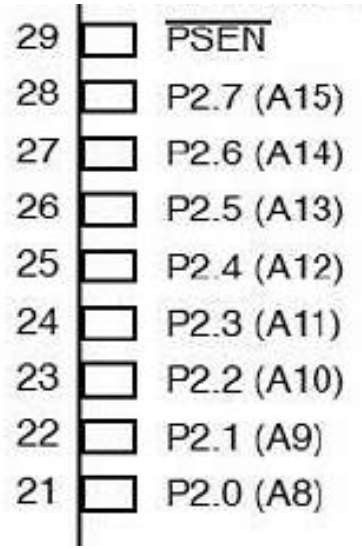


PORT 3 Pin	Function	Description
P3.0	RXD	Serial Input
P3.1	TXD	Serial Output
P3.2	INT0	External Interrupt 0
P3.3	INT1	External Interrupt 1
P3.4	T0	Timer 0
P3.5	T1	Timer 1
P3.6	WR	External Memory Write
P3.7	RD	External Memory Read



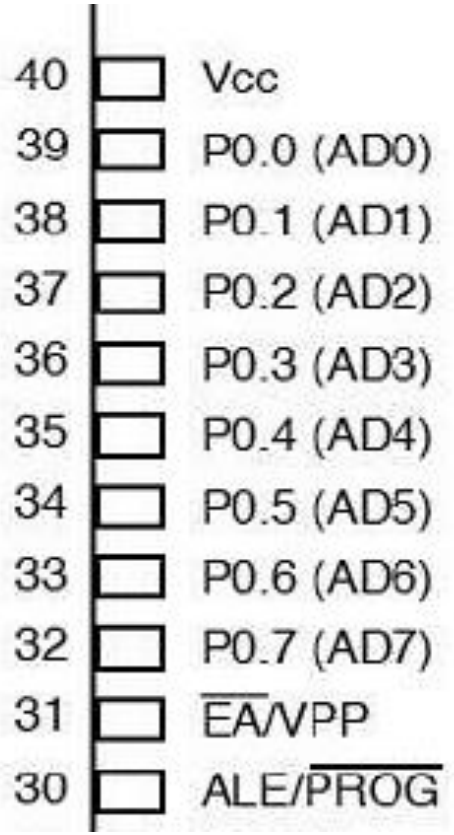
- **Pin 18 and 19:**
- It is XTAL1 and XTAL1 pins respectively.
- These pins are used for connecting an external crystal to get the system clock.

- **Pin 20 (GND):**
- It is a ground pin.
- This pin is connected to the ground and serves as the reference voltage for the microcontroller.
- **Pin 21 to 28 (Port 2):**
- These pins are bidirectional I/O port.
- Higher order address bus signals are multiplexed with this bidirectional port.
- **Pin 29 (PSEN):**
- It is a Program Store Enable Pin.
- Using this PSEN pin external program memory can be read.



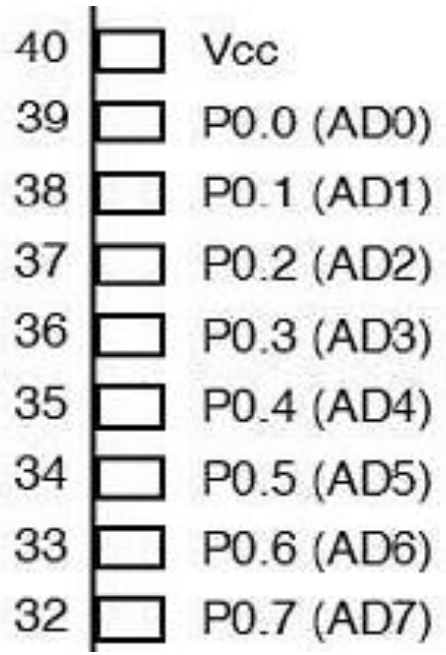
- **Pin 30 (ALE/PROG):**
- This pin is the Address Latch Enable pin.
- It is input, active-high pin.
- This pin is used to distinguish between memory chips when multiple memory chips
- During flash programming i.e. Programming of EPROM, this pin acts as program pul
- Using this pin, external address can be separated from data.

- **Pin 31 (EA/VPP):**
- Named as external Access Enable Pin (EA).
- It is used to enable or disable the external program memory interfacing.
- VPP: This pin is used for programming the microcontroller.



- **Pin 32 - 39 (Port 0):**
- These are also a bidirectional I/O pins but without any internal pull-ups.
- Hence, it requires external pins in order to use port 0 pins as I/O port.
- Lower order data and address bus signals are multiplexed with this port.

- **Pin 40 (VCC):**
- This pin is used to supply +5V voltage power to the circuit.



Thank You